

## CLAIMS

1. A method for organizing a set of nodes into a minimum number of connected clusters in a wireless transmission system, said method comprising steps of;
- 5 using of bits in packets used in the initial stages of the device discovery procedure, to include information relating to a state of said nodes during the initial stages of the procedure;
- setting parameters in the procedure for device discovery to achieve the said separation of the nodes into those in said transmit-state and said receive-state;
- 10 defining Master-designates among said nodes through a statistical procedure and defining remaining nodes as a Slave-designate;
- defining clusters including said Master-designates and at least one said Slave-designate, wherein said Slave-designate continuously scans for said inquiry message transmitted from said Master-designate and said Slave-designate transmits said inquiry message to said Master-designate upon receiving said inquiry message to establish a connection between said Master-designate and said Slave-designate.
- 15
2. The method according to the claim 1, wherein at least one Super-master-designate is selected from said Master-designate and at one Proxy-Slave is selected for each
- 20 Master-designate, said method further comprising a step of communicating between said Super-master-designate of one of said cluster and said Proxy-Slave of other of said cluster such that said Super-master-designate collects information of said clusters from each of said Proxy-Slave having an predetermined ID.
- 25
3. The method according to the claim 1, wherein said bits in said packet are transmitted in initial stages of discovery of nodes and include information to convey states of said nodes.
- 30
4. The method according to the claim 1, wherein an interval of said inquiry scan is close to a duration of a scan window for said inquiry scan.
- 35
5. The method according to the claim 1, wherein said bits in said packet include information selected from the group consisting of numbers of responses received by said node by a predetermined period, numbers of said nodes included in said cluster, whether or not said node transmitted said inquiry response is included in said cluster, and whether or

*Solv Ag*  
5  
*Cont*

not said node transmitting said inquiry response is said Master-designate.

6. The method according to the claim 1, wherein said statistical procedure includes Bernoulli trials executed by each node.

7. The method according to the claim 1, wherein said wireless transmission system is a Bluetooth System.

8. A system for organizing a set of nodes into a minimum number of connected clusters 10 of bounded size in a wireless transmission system, said system comprising;

means for using of bits in packets used in the initial stages of the device discovery procedure, to include information relating to a state of said nodes during the initial stages of the procedure;

means for setting parameters in the procedure for device discovery to achieve the 15 said separation of the nodes into those in said transmit-state and said receive-state;

means for defining a Master-designate among said nodes through a statistical procedure and defining remaining nodes as a Slave-designate;

means for defining a cluster including said Master-designate and at least one said 20 Slave-designate, wherein said Slave-designate continuously scans for said inquiry message transmitted from said Master-designate and said Slave-designate transmits said inquiry response to said Master-designate upon receiving said inquiry message to establish a connection between said Master-designate and said Slave-designate.

9. The system according to the claim 8, wherein at least one Super-master-designate is 25 selected from said Master-designate and at one Proxy-Slave is selected for each Master-designate, said system further comprising means for communicating between said Super-master-designate of one of said cluster and said Proxy-Slave of other of said cluster such that said Super-master-designate collects information of said clusters from each of said Proxy-Slave having an predetermined ID.

30

10. The system according to the claim 8, wherein said bits in said packets are transmitted in initial stages of discovery of nodes and include information to convey states of said nodes.

11. The system according to the claim 8, wherein an interval of said inquiry scan is close 35 to a duration of a scan window for said inquiry scan.

- Sub  
pa  
5  
Com*
12. The system according to the claim 8, wherein said bits in said packets include information selected from the group consisting of numbers of received by said node by a predetermined period, numbers of said nodes included in said cluster, whether or not said node transmitted said inquiry response is included in said cluster, and whether or not said node transmitting said inquiry response is said Master-designate.
13. The system according to the claim 8, wherein said statistical procedure includes method includes Bernoulli trials executed by each node.
- 10
14. The system according to the claim 8, wherein said wireless transmission system is a Bluetooth System.
- 15
15. The system according to the claim 14, wherein nodes which are connected as slaves in a piconet carrying on said node discovery on behalf or in addition to said Master-designate such that a piconet/scatternet for the Bluetooth system is formed.
16. The system according to the claim 15, wherein said Master-designate of the piconet keep one or more nodes in a park mode and said Master-designate also keeps one or more active mode device addresses (AM\_ADDRs) reserved for unparking one or more of said parked nodes.
- 20
17. The system according to the claim 16, wherein parked Slaves transmit said inquiry message on behalf of or in addition to said Master-designate and when said parked Slaves receive a response from a new node.
- 25
18. The system according to the claim 16, wherein the Master-designate uses a reserved AM\_ADDR/s for unparking Slaves.
- 30
19. A computer program product having a computer readable medium having a computer program recorded therein for organizing a set of nodes into a minimum number of connected clusters of bounded size in a wireless transmission system, said computer program product including:
- computer program code means for using of bits in packets used in the initial stages of the device discovery procedure, to include information relating to a state of said nodes
- 35

during the initial stages of the procedure;

computer program code means for setting parameters in the procedure for device discovery to achieve the said separation of the nodes into those in said transmit-state and said receive-state;

5 computer program code means for defining a Master-designate among said nodes through a statistical procedure and defining remaining nodes as a Slave-designate; and

computer program code means for defining a cluster including said Master-designate and at least one said Slave-designate, wherein said Slave-designate continuously scans for said inquiry message transmitted from said Master-designate and said Slave-designate  
10 transmits said inquiry response to said Master-designate upon receiving said inquiry message to establish a connection between said Master-designate and said Slave-designate.

20. The computer program product according to the claim 19, wherein wherein at least one Super-master-designate is selected from said Master-designate and at one Proxy-Slave

15 is selected for each Master-designate, said computer program further comprising means for communicating between said Super-master-designate of one of said cluster and said Proxy-Slave of other of said cluster such that said Super-master-designate collects information of said clusters from each of said Proxy-Slave having an predetermined ID.

20. 21. The computer program product according to the claim 19, wherein said bits in said packet are transmitted in initial stages of discovery of nodes and include information to convey states of said nodes.

22. The computer program product according to the claim 19, wherein an interval of  
25 said inquiry scan is close to a duration of a scan window for said inquiry scan.

23. The computer program product according to the claim 19, wherein said bits in packets include information selected from the group consisting of numbers of responses received by said node by a predetermined period, numbers of said nodes included in said  
30 cluster, whether or not said node transmitted said inquiry response is included in said cluster, and whether or not said node transmitting said inquiry response is said Master-designate.

24. The computer program product according to the claim 19, wherein said statistical  
35 procedure includes Bernoulli trials executed by each node.

25. The computer program product according to the claim 19, wherein said wireless transmission system is a Bluetooth System.